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Chronic Leg Ulceration in a Patient with Leprosy

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WHILE THERE ARE a reputed fifteen million cases of leprosy in the world, the diagnosis is often missed in the United States. This is due partially to its rarity, but also to its many unusual and confusing presentations. There are approximately one hundred newly diagnosed cases reported per year in the United States, the largest number of these being from California (about 26 new cases each year) with about one-third of the patients being Mexican in origin.[1]

We recently saw a case of leprosy in a 45-year-old Cuban immigrant who presented with chronic leg ulcers.

Report of a Case

The patient was a 45-year-old Cuban woman who presented in June 1973 with ulcerations and anesthesia of the left lower leg of about six months' duration. She had recently arrived from Spain after having gone there three years previously from Cuba. She had been seen by a physician in Spain because of a skin rash that developed early in 1972 and a sulfa drug had been prescribed for her in December 1972. In February of 1973 the rash worsened and ulcers developed on the left leg. Because she felt this might be a reaction to the sulfa drug, she stopped taking it. At the time she was examined by us, information as to the type of "sulfa" drug and the cause and treatment of the "skin rash" was unattainable.

The patient described the rash as having started as small pink non-pruritic areas on the arms and legs which later became brownish and spread to her face. The ulcers on the legs began as large erythematous areas which subsequently blistered and then sloughed, leaving deep ulcerations. There was no known family history of a similar disease process.

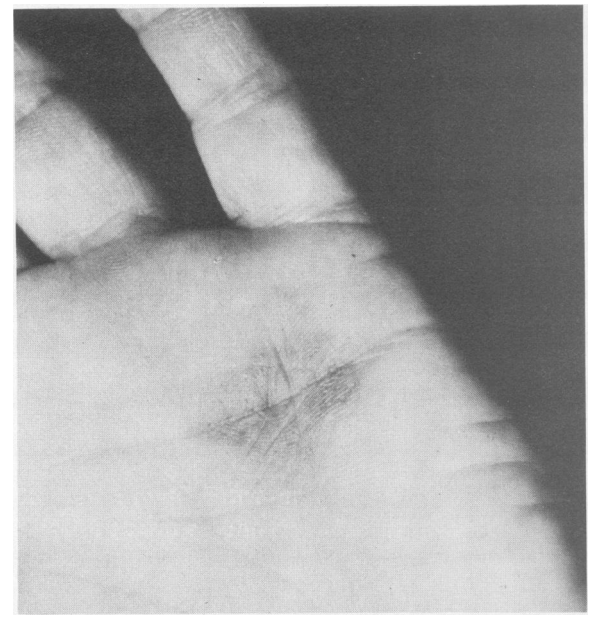

Figure 1.—A well-circumscribed, flat, erythematous macule on palm of hand.

On physical examination the patient was afebrile and the vital signs were stable. There was no loss of eyebrows nor was there any infiltration of the skin of the face. The eyes, ears, nose, and throat were normal without nodules or ulcerations. There were several 1-cm circumscribed, flat, erythematous lesions over the lower jaw and chin. Results of thoracic, cardiac, and abdominal examinations were within normal limits. There were multiple well-circumscribed, flat reddish-brown macules over the skin of the extremities and upper back (Figure 1). These varied from 1 to 5 cm in diameter and were uniformly hypasthetic to pinprick.

The skin of the lower extremities was very thin and it was anesthetic in the area consistent with the sensory distribution of the cutaneous branches of the left common peroneal nerve. Within the distribution of this nerve there were also noted to be deep, circumscribed, irregular, infected ulcers varying from 0.5 cm to 8 cm in diameter with deep interconnecting sinuses extending as deep as the underlying muscular fascia (Figure 2). Mild weakness of the dorsiflexors and plantar everters of the left foot was noted. In addition the left

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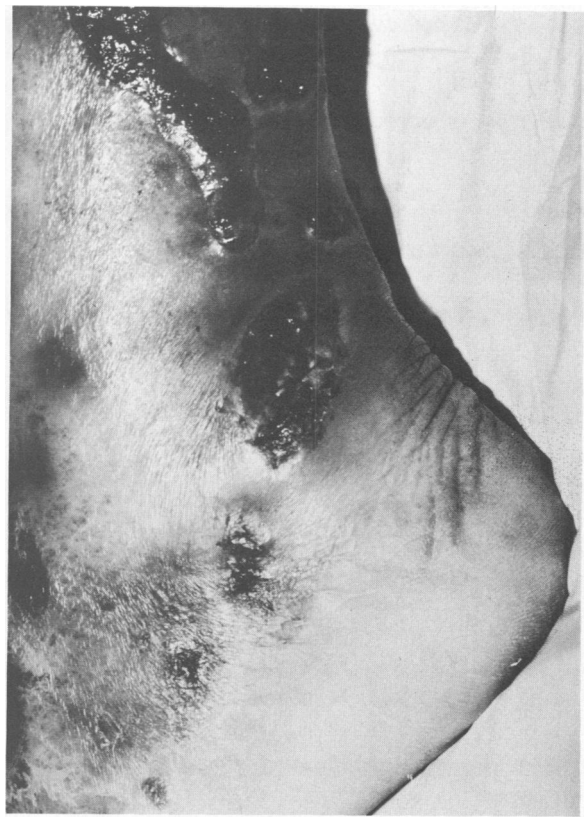

Figure 2.—Chronic leg ulcerations.

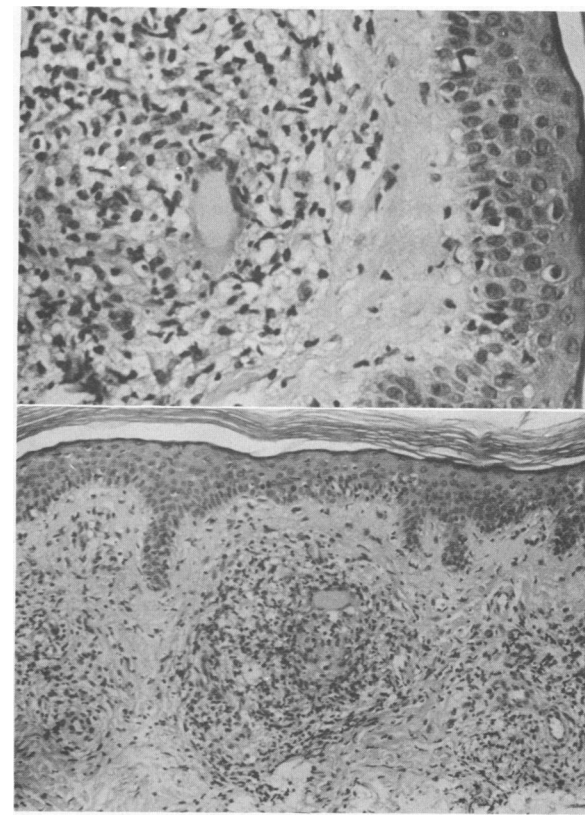

Figure 3.—Biopsy specimen from margin of an ulcer, showing non-caseating granulomas with giant cells, epithelioid histiocytes and foamy histiocytes. (Upper frame × 400, lower frame × 80.)

common peroneal nerve at the knee was palpable. All arterial pulses were present, normal and equal. There was no evidence of venous or arterial disease. Deep tendon reflexes were normal.

Laboratory data

The hematocrit was 34 percent, leukocyte count 5,500 per cu mm with the cell differential normal, fasting blood glucose 90 and two-hour post-prandial blood sugar 132. Serologic tests for syphilis were negative. Cultures from the ulcers grew enterobacter cloacae and staphylococcus aureus. The cultures were negative for fungus and mycobacterium tuberculosis. X-ray films of the bones of the lower extremities gave no evidence of osteomyelitis. Nerve conduction studies of the left peroneal nerve compared with the right showed extremely long latency with pronounced slowing of nerve conduction. Nerve conduction in the arms was supra-normal.

A biopsy specimen obtained from the margin of one of the ulcers showed multiple areas of non-caseating granulomas with giant cells, epithelioid histiocytes and foamy histiocytes. These were tightly arranged in perivascular granulomas (Figure 3). A sural nerve biopsy showed very similar granulomatous changes with considerable infiltration of the sural nerve, but neither biopsy showed lepra bacilli with Fite's stain.

It was eventually learned that the sulfa drug taken for the skin rash was dapsone (Avlosulfon®) and that it had been given by the physician who treated the patient for the diagnosis of leprosy. Unfortunately, the patient had not understood the nature of her disease.

On the basis of the history, clinical examination, and laboratory data, a diagnosis of leprosy was made and dapsone was again prescribed, 50 mg by mouth four times a day.

The ulcers, treated initially with local wound care, were successfully closed with thin split-thickness skin grafts. The patient then was able to ambulate with an unna boot protecting the relatively anesthetic left leg from trauma. After the wounds had healed, and with the patient ambulating, she was discharged, taking dapsone.

TABLE 1.—*Etiology of Chronic Leg Ulceration*[5]

Vascular
- a. Arterial: large vessel; small vessel; acute vasculitis
- b. Venous: stasis; post phlebitic syndrome
- c. Lymphatic: congenital, acquired

Neoplastic

Squamous cell carcinoma, basal cell carcinoma, malignant melanoma, Kaposi's sarcoma

Traumatic

Infectious
- a. Bacterial
- b. Mycotic: blastomycosis, leishmaniasis
- c. Syphilis
- d. Chronic osteomyelitis
- e. Tuberculosis
- f. Other: Meleney's ulcer, cat-scratch disease, Buruli ulcer

Metabolic
- a. Necrobiosis lipoidica diabeticorum, erythema induratum, Sjögren's disease
- b. Hyperimmune states: pyoderma, pyoderma gangrenosum
- c. Blood diseases: Cooley's and sickle cell anemias, cryoglobulinemia, leukemia, senile purpuras

Neurotrophic
- a. Central lesions: tabes dorsalis, syringomyelia, maldevelopment of cord, pressure sores
- b. Peripheral nerve lesions: diabetes, trauma, leprosy, avitaminosis, amyloid, heavy metals

Discussion

Leprosy is a chronic, slowly progressive granulomatous disease caused by the acid-fast bacillus mycobacterium leprae. Its multitude of different presentations is owing mainly to differing degrees of host resistance. At one end of the spectrum is lepromatous leprosy in which there is little host resistance and the bacilli invade skin, nerves and mucous membranes diffusely, as well as commonly involving internal organs.[2] Pathologically, foam cell granulomas infiltrate the tissues, and grossly the skin is thickened and nodular. Eventually the classical "leonine facies" may develop. At the other end of the spectrum is tuberculoid leprosy with higher degrees of host resistance and only focal involvement of nerves and areas of skin. The skin lesions are much more subtle, usually being only flat, circumscribed hypopigmented or hyperpigmented plaques. Biopsy of these lesions shows the typical giant cells and epithelioid cells of tuberculoid granulomas. Common to the entire spectrum of leprosy is the unique involvement of the nerves. Both the large peripheral nerves—first the sensory fibers and later the motor fibers—as well as the small sensory nerves underlying the skin lesions are commonly involved. A careful neurologic examination may uncover important clues to the diagnosis since no other infectious disease and very few dermatologic conditions involve the peripheral nerves in this way. Skin ulcerations may occur in at least two ways. The anesthetized areas of the skin are easily traumatized, burned or secondarily infected. In addition, patients with diffuse lepromatosis may develop an acute immune-like reaction known as "erythema necroticans," in which angular inflamed lesions develop over the legs or arms or both, and then shortly slough to leave deep ulcers.[3,4]

In the differential diagnosis of chronic leg ulceration (Table 1) a combination of (1) travel in or history of living in an endemic area and (2) a peripheral nerve lesion with or without associated anesthetic areas, and (3) suggestive skin lesions in the distribution of the involved nerve, should make one suspicious of leprosy.

The patient presented had lived in Cuba and she had a peripheral nerve lesion associated with skin lesions in the distribution of the involved nerve—in her case it was the common peroneal—with anesthesia consistent with the cutaneous branches and disability of motor function consistent with the superficial peroneal nerve branch.

We have presented this unusual case as a reminder to the practicing clinician that leprosy still exists in the United States and continues to evade diagnosis. We would like to emphasize that culturing bacterial pathogens found superficially may not be sufficient and that skin and nerve biopsy may be necessary to make the correct diagnosis of leprosy. It is a treatable infectious disease that will only be discovered if suspected and looked for on a biopsy.

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